If a Wisconsin Unique Well Number (WUWN) has been assigned to your well, you may choose to have a copy of your test results stored in a permanent file for your well by writing the WUWN on the lab form and checking the box "send copy of results to DNR." Results of water quality tests done by the State Laboratory of Hygiene are automatically reported to DNR for filing. You can find your Unique Well Number close to the sampling faucet on the water pipe entering the building from the well or on the main electrical fuse box.

What should I do if my water is high in nitrate?

If the nitrate-nitrogen concentration of your water exceeds the 10-milligram per liter standard, the following actions are recommended:

- Do not give the water to infants less than 6 months of age or use the water to prepare infant formula.
- Avoid drinking the water during pregnancy.
- Do not attempt to remove the nitrate by boiling the water. This will only increase the nitrate concentration.
- Seek medical help immediately if the skin color of an infant appears bluish or gray. Sometimes color change is first noticed around the mouth, or on the hands and feet.
- Try to identify the source of the nitrate to see if there are things you can do to reduce or eliminate the source. By reducing the amount of fertilizer you use, improving manure-handling methods, maintaining your septic system and pumping septic tanks regularly to prevent overflow, you may be able to protect your water supply.
- A safer, longer-term remedy is to drill a new well with deeper casing.
- Limit daily intake of your well water if you have chronic health problems that may increase your sensitivity to nitrate, or if you are concerned about scientific uncertainty regarding the health effects of long-term exposure to nitrate-contaminated water.

Where can I get more information?

Licensed well drillers can help you determine whether drilling a well with more casing can reduce the nitrate levels in your water. Check your local phone directory under "Water Well Drilling & Service."

The Wisconsin Department of Health and Family Services (DHFS), Division of Public Health can give you more information on the potential health effects of nitrate exposure. Call (608) 266-0923 or visit the DHFS website at **dhfs.wi gov**.

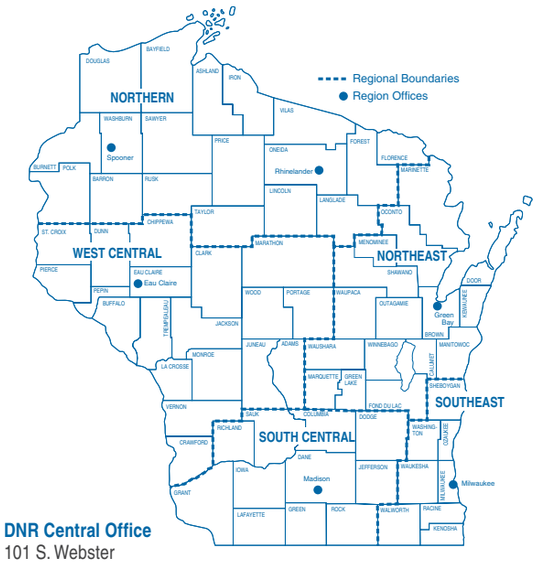
The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) can give you more information on ammonium-nitrate fertilizers and where and how they may be used in Wisconsin. Call (608) 224-4500 or visit the DATCP website at **datcp.state.wi.us**.

A list of certified labs is available from DNR online at **dnr.wi.gov/org/es/science/lc/** under the category "Certified Lab Lists." You may also find laboratories listed in your local telephone book under "Laboratories-Testing."

DNR has more information about drinking water on its website at **dnr.wi.gov**. Choose "Drinking Water & Groundwater" from the drop-down program menu, and select from a variety of listed topics.

The University of Wisconsin-Cooperative Extension has many publications related to drinking water and water quality available on its website. Go to **cecommerce.uwex.edu/**. Click on "Water Quality" under the "Natural Resources" drop-down menu.

Department of Natural Resources Offices



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Madison, WI 53707-7921
(608) 266-0821

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810 W. Maple Street
Spooner, WI 54801
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P.O. Box 10448
Green Bay, WI 54307-0448
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Southeast Region
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee, WI 53212
(414) 263-8500

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Eau Claire, WI 54702-4001
(715) 839-3700

South Central Region
3911 Fish Hatchery Road
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(608) 275-3266

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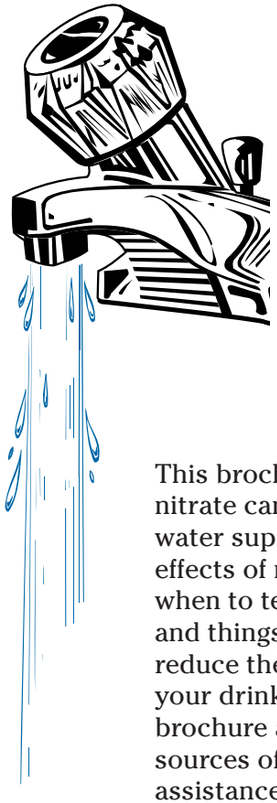


Nitrate In Drinking Water

This brochure explains how nitrate can enter drinking water supplies, the health effects of nitrate exposure, when to test a private well, and things you can do to reduce the nitrate level in your drinking water. The brochure also provides sources of information and assistance that may be useful to private well owners.

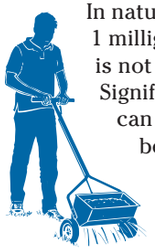
The Wisconsin Department of Natural Resources Bureau of Drinking Water and Groundwater would like to thank the Groundwater Coordinating Council (GCC) Education Sub-Committee for its part in the development and editing of this publication. For more information on the GCC, it's member organizations and programming, please visit ***wisconsin.gov****. Choose "Government," "State Agencies," followed by "List of Agencies" then select "Groundwater Coordinating Council."*

Wisconsin Department of Natural Resources
Bureau of Drinking Water & Groundwater

What is nitrate?

Nitrate (NO_3^-) is a compound made up of nitrogen and oxygen. It is formed when nitrogen from ammonia or other sources combines with oxygen in water. Nitrate is naturally found in plants and in vegetables at varying concentrations. It often shows up in groundwater depending on the amount of fertilizer applied to crop fields. According to the U.S. Environmental Protection Agency, most adults who are eating a balanced diet may consume 10-25 milligrams of nitrate-nitrogen per day in their food. Most of this nitrate comes from leafy vegetables like lettuce, cabbage, celery, spinach, and cured meats. Additional exposure to nitrate from contaminated drinking water may pose a significant health risk.

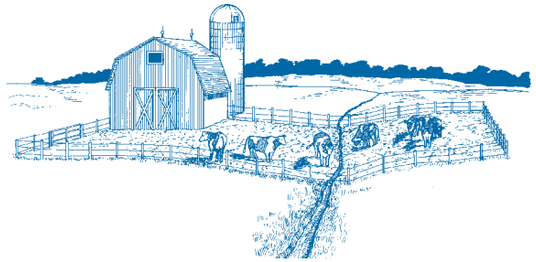
How does nitrate enter groundwater?



In nature, water usually contains less than 1 milligram of nitrate-nitrogen per liter and is not considered a health concern. Significantly higher nitrate concentrations can indicate that the drinking water has been contaminated and may pose a serious health concern. Common sources of nitrate include ammonium-nitrate fertilizers, barnyard runoff, septic systems, municipal sewage treatment systems, and decaying plant debris. Nitrate dissolves easily in water and does not adsorb onto the soil. It can easily be carried into the groundwater by rainwater and melting snow as they percolate through the soil and bedrock into the underlying aquifer.

Is my well at risk?

The only way to know if your drinking water contains excessive nitrate is to have a water sample analyzed by a certified laboratory. There are also several things you can check to determine your well's vulnerability to nitrate contamination.



- Well Location. Nitrate-contaminated wells are often located downhill from farm fields, barnyards, feedlots, septic tanks, municipal wastewater treatment systems or "sludge" spreading sites.
- Well casing depth and construction. Since nitrate enters the aquifer from the ground surface, wells that have shallow casing are more likely to be affected than deeper cased wells.
- Geology. Areas with highly porous, sandy soils, fractured bedrock, natural caves and sinkholes, and shallow depths to groundwater are especially vulnerable to contamination. Areas with highly exposed creviced bedrock or specific geologic conditions known as "karst" limestone geology, present in much of Door County for example, may also be vulnerable to nitrate contamination.

What are the health risks of consuming water with high concentrations of nitrate?

State and Federal laws set the maximum allowable level of nitrate-nitrogen in public drinking water at 10 milligrams per liter (10 parts per million). State and Federal laws are not directly enforced on private water systems, but 10 milligrams per liter is recommended as an advisory level for private wells.

Nitrate-contaminated water should never be fed to an infant under 6 months of age. In young infants, ingestion of nitrate can reduce the blood's ability to carry oxygen. In severe cases it can cause a condition that doctors call methemoglobinemia. The condition is also called "blue baby syndrome" because the infant's skin appears blue-gray or lavender in color. This skin color change is caused by a lack of oxygen in the blood.

All infants less than 6 months of age are at risk of nitrate toxicity, but premature babies and babies with other health problems are more sensitive than healthy infants. **An infant suffering from "blue baby syndrome" needs immediate medical care because the condition can lead to coma and death if it is not treated promptly.**

When nursing mothers ingest water containing elevated concentrations of nitrate, the amount of nitrate in breast milk may increase slightly. Although no confirmed cases of "blue baby syndrome" have been associated with nitrate in breast milk, it may be advisable for nursing women to avoid drinking water that contains more than 10 milligrams of nitrate per liter of water.

Some scientific studies have also found evidence suggesting that women who drink nitrate-contaminated water during pregnancy are more likely to have babies with birth defects. This may be because nitrate ingested by the mother may also lower the amount of oxygen available to the fetus.

People who have heart or lung disease, certain inherited enzyme defects or cancer may be more sensitive to the toxic effects of nitrate than healthy individuals. Some researchers also suspect that consuming nitrate-contaminated water may increase the risk of certain types of cancer.

Water test data suggest wells contaminated with significant concentrations of nitrate are more likely to also be contaminated with agricultural pesticides. If your water is contaminated with nitrate, you may also want to have the water tested for pesticides, especially if your well is near farm fields.

How do I know if my water is safe to drink?

Public Water Systems

All public water systems are required to notify consumers if any regulated contaminant, including nitrate, exceeds the maximum contaminant level (MCL) that is set by the federal Safe Drinking Water Act. Municipal systems (such as city, town, or sanitary districts) and Other-Than-Municipal (OTM) systems (such as mobile home parks or condominium associations) are required to report *any* detection of a regulated contaminant that occurred in the previous year in their annual Consumer Confidence Report (CCR). If you would like to view your community's CCR, contact your local water supplier or visit the Wisconsin Department of Natural Resources (DNR) website at **dnr.wi.gov**. Choose "Drinking Water & Groundwater" from the drop-down "Program" menu. Then choose "Public Water Systems" under "Access Water Quality Databases" link. A search can then be made by city or individual system.

Treatment methods are available that can reduce the levels of nitrate in the drinking water supply, but some methods may be more appropriate or cost-effective than others. In many cases the best option for a community is to drill a new well.

Private Well Owners

The only way to know if your drinking water contains nitrate is to have a water sample from your private well tested by a certified laboratory. A list of certified labs is available from the Department of Natural Resources (DNR) or online at **dnr.wi.gov/org/es/science/lc**. A nitrate test is recommended for all newly constructed private wells and wells that have not been tested during the past 5 years. Testing is also recommended for well water used by pregnant women and is essential for a well that serves infants under 6 months of age. Wells with nitrate concentrations between 5 and 10 milligrams per liter should be tested annually. Additional testing may also be useful if there are any known sources of nitrate or if high nitrate concentrations are found in neighboring wells.